Virus Group Working Paper
Asilomar
2.25.75

Preparation and Use of Recombinant Molecules Involving Animal Virus Genomes

The construction and study of hybrid DNA molecules offer many potential scientific and social benefits. Because the possible biohazards associated with the work are difficult to assess and may be real, it is essential that investigations be re-initiated only under conditions designed to reduce the possible risks. Although the need for the development of new and safer vectors is clear, we believe that the study of these recombinant DNAs can proceed with the application of existing National Cancer Institute guidelines for work involving oncogenic viruses. We point out that is likely that cellular DNAs contain nucleotide sequences similar to those found in viral genes, including genes associated with oncogenic transformation. Therefore the following recommendations are made for the preparation and use of recombinant DNA molecules derived from animal viruses and mammalian cells.

Biohazard Classification and Guidelines

"The National Cancer Safety Standards for Research Involving Oncogenic Viruses" is divided into standards for control of (1) low risk, (2) moderate risk, and (3) high risk oncogenic viruses (see appendix). With the exceptions noted below, we recommend that self-replicating recombinant DNA molecules containing animal virus genomes or genome segments in biological vectors be handled according to guidelines for moderate risk oncogenic viruses. Experiments involving purified segments of viral genomes that are proven not to be associated with pathogenicity may be carried out according to the guidelines for low risk oncogenic viruses. On the other hand, genome segments from highly pathogenic viruses, e.g., smallpox, Lassa virus, hemorrhagic fever agents and others listed as class 4 in "Classification of etiologic agents on the basis of hazard" (Atlanta, Ga. CDC Publication) should be handled according to the guidelines for high risk oncogenic viruses. The vast majority of experiments, however, will fall into the moderate risk category.

Regulation

We recommend that facilities and practices in investigations involving recombinant DNAs be reviewed and approved by institutional committees which would both advise principal investigators and certify in writing to granting agencies that proposed studies would be done according to the specified guidelines.

We also recommend that a national and/or international body review the guidelines and classifications periodically. To facilitate this review, additional data should be acquired; for example, it is important to assess the biological activity of DNA injected into animals, the transfer of plasmids between bacterial strains in the gut, the persistence there of carrier DNAs, and the efficacy of the immune response in dealing with new plasmids introduced into the gut.

M. Bishop
D. Jackson
D. Nathans
B. Roizman
J. Sambrook
A. Shatkin
D. Walker